METHOD AND APPARATUS FOR PROVIDING A SECURE SYSTEM TIME

BACKGROUND OF THE INVENTION

1. Field of the Invention

Embodiments of the present invention generally relate to digital rights management (DRM). More specifically, the present invention relates to a method and apparatus for providing a secure system time.

2. Description of the Related Art

Digital multimedia contents have gained wide acceptance in the public. As such, many consumers and businesses have digital media systems that enable the reception of such digital multimedia contents via various communication channels, e.g., via a wireless link such as a satellite link or a wired link such as cable connections and/or telephony based connections such as DSL and the like.

Irrespective of the communication channels that are employed to receive the digital multimedia contents, owners of multimedia contents and the service providers (e.g., a cable service provider, a telecommunication service provider, a satellite-based service provider) who provide such multimedia contents to subscribers are concerned with the protection of such digital multimedia contents. To illustrate, a service provider may receive a request from a subscriber to download a movie for viewing for a given period of time. This business arrangement is similar to going to a video store to rent the movie for a given period of time. Unlike the video store approach, the service provider can simply provide the requested movie electronically to a receiver of the subscriber for the requested period of time. Unlike the video store approach, the service provider does not need the subscriber to return the movie. However, the service provider does not want the subscriber to have the ability to view the movie after the given period of time has expired. As such, the notion of system time is one aspect that needs to be carefully defined and protected.

Thus, there is a need in the art for a method and apparatus for providing a secured system time.

SUMMARY OF THE INVENTION

In one embodiment, the present invention discloses an apparatus and method for providing a secured system time reference to a subscriber device, e.g., a set top box or a receiver. In one embodiment, the system time reference is provided in a secure system time message that is broadcasted to a plurality of subscriber devices. Each subscriber device has a security device or software application that is capable of determining whether the received system time reference is legitimate. If the system time reference is determined to be legitimate, a local time reference is synchronized with said received system time reference. In one embodiment, a time sequence number is also received by the security device to assist in the determination of legitimacy of the received system time reference.

BRIEF DESCRIPTION OF THE DRAWINGS

So that the manner in which the above recited features of the present invention can be understood in detail, a more particular description of the invention, briefly summarized above, may be had by reference to embodiments, some of which are illustrated in the appended drawings. It is to be noted, however, that the appended drawings illustrate only typical embodiments of this invention and are therefore not to

be considered limiting of its scope, for the invention may admit to other equally effective embodiments.

FIG. 1 illustrates a high level view of a digital multimedia content distribution system of the present invention;

FIG. 2 illustrates a method for providing secure system time in accordance with the present invention; and

FIG. 3 illustrates the present invention implemented using a general purpose computer.

To facilitate understanding, identical reference numerals have been used, wherever possible, to designate identical elements that are common to the figures.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In one embodiment of the present invention, Digital Rights Management (DRM) may specify one or more usage rules pertaining to digital multimedia contents that have been downloaded and stored locally by subscribers, e.g., stored on a hard drive. One such usage rule is the length of time that a subscriber is allowed to access the stored digital multimedia contents (e.g., play the digital multimedia contents). The length of time or time window is configurable by a content or service provider, e.g., the length of time can be several hours, a day, several days, a week, and so on. In fact, the length of time can be associated with how much the subscriber is willing to pay for access to the multimedia contents.

Thus, a receiver of the subscriber generally has a security device or a software application that has access to a time reference to implement a time based usage rule. For example, the security device should be aware of the overall system time, so that it can regulate the usage of the received and stored multimedia contents.

FIG. 1 illustrates a high level view of a digital multimedia content distribution system 100 of the present invention. System 100 comprises a content provider 110, a service provider 120, a satellite transmission channel 130, an access network 135 and a plurality of subscriber devices 140a and 140b.

In one illustrative embodiment, the content provider 110 comprises a plurality of digital multimedia content 112, a plurality of encoders, multiplexers, encryptors 114, a controller 116 and a digital rights server (DRS) 118. Those skilled in the art will realize that the content provider 110 may implement additional components that are not shown in FIG. 1 to effect the transmission of multimedia contents.

In operation, DRS 118 provides digital rights control message (DRCM) to the controller 116. The digital rights control message may contain various rules pertaining to the protection of the digital multimedia contents that will be downloaded by subscribers. In one embodiment, rules of usage of the digital multimedia contents are included in the digital rights control message. In one embodiment, one of the rules of usage is a time-based usage rule that dictates a length of time that a subscriber will have to access the downloaded digital multimedia contents. In one embodiment, a secure system time message (SSTM) will be generated and sent to the subscriber to effect this time-based usage rule as further described below.

The controller 116 in accordance with the DRCM will cause multimedia contents 112 to be retrieved and processed into packets for transmission over a satellite communication channel 130. The processing may embody the usage of an encoder, an encryptor and/or a multiplexer with well known algorithms.

FIG. 1 illustrates two different scenarios where a subscriber receiving device 140a will receive the packets directly from the content provider 110 or a service provider 120 will